



HÄZZE



SOLAR



Pb



APPLICATIONS

Photovoltaic power supply of:

- Power plants of remote villages
- Signal Installations of the air-, sea-, road and railway transport
- Radio relay stations of telecommunication services
- Cellular roadside and roof top transmission / repeater stations
- Street & garden lighting
- Hybrid power supplies



Batteries have terminal options to meet the multitude of connection requirements.

Haze SOLAR are all SLA - VRLA Industrial Monobloc units, eliminating the need for maintenance and the possibility of acid spills.



CONSTRUCTION - SOLAR Gel battery construction is as shown in the diagram. The positive and negative grids are cast from a calcium/tin lead alloy to reduce grid growth and corrosion. The active material is manufactured from a high purity lead (99.9999%) to minimize the negative effects of impurities.

Separator is manufactured by world leaders in the field, utilizing the latest German technology. The base material is a microporous duroplastic exhibiting excellent high temperature stability and mechanical strength, resulting in very good resistance to vibration and mechanical shock. The integrity of the battery will be maintained under extreme conditions.

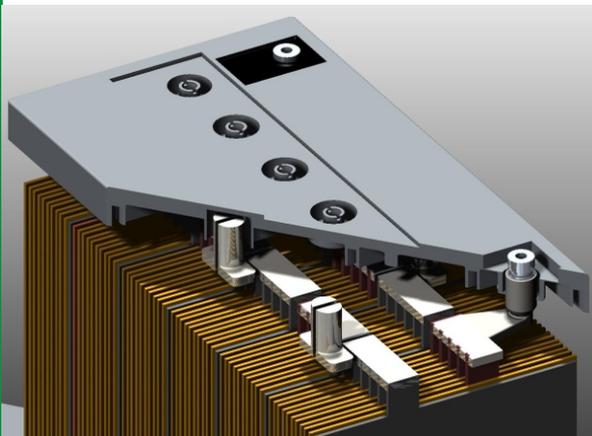
The purpose of the separator is to maintain a constant distance between the positive and negative plates, totally eliminating the possibility of short circuits whilst allowing the active materials to fully react with the gelled electrolyte.

The separator also has an open construction, which allows little resistance to the flow of the electrolyte during filling.

A thin layer (typically 0.4mm) of non-woven glass mat is an integral part of the separator and is placed against the positive plate for improved surface contact.



Gel construction with case removed and cover cut away to show internal battery parts.



ELECTROLYTE FILLING - Gelled electrolyte is introduced to the cell by means of custom-built vacuum filling machines; vacuum cycling is utilized after the filling process. The battery design and construction negates the need for electrolyte addition and the battery remains maintenance free throughout its design life.

Typical separator properties are:

- Acid displacement - 150 ml /sqm
- Pore volume - 70%
- Average pore size - 0.5 micro m
- Maximum pore Diameter - 1 micro m

CHARGING CHARACTERISTICS

Solar installations can occasionally have limitations on their ability to charge batteries due to unfavourable weather conditions, for this reason charging voltages should optimise the charge time available and higher currents are ideal to "RAPID" charge the battery.

The charging current may vary from 0.01 to 5 times I10 but the charging voltage should be restricted to 2.3 to 2.4 VPC.
 Daily discharge below 0.2 C100 - 2.30-2.35VPC
 Daily discharge above 0.2 C100 - 2.35-2.40VPC
 (Based on 20 °C)

If the monthly average temperature is below 10 °C the charging voltage should be increased by 0.03V per °C.

Each battery technology has its advantages and disadvantages, it is therefore important to choose the right battery for the application.

For SOLAR applications GEL technology is without doubt the right choice, the price premium is easily off-set by the life and cycle expectations for this demanding application subjected to high and low temperatures, unpredictable charging, daily cycling, probable partial state of charge discharges.

Advantages of Gel Batteries:

- Full recovery from deep discharge, even when the battery is not recharged immediately.
- Ideal for repeat cycling daily use.
- Excellent performance over long discharges
- Good tolerance to higher temperature applications
- Improved resistance to freezing
- Suitable where mains power is unstable
- Zero stratification due to immobilized electrolyte
- No equalization charge necessary
- Reduced self-discharge
- Limiting design protects the positive plates to greatly improve cycle life
- Thicker plates for reduced grid corrosion and increased cycle life
- Improved charge acceptance due to low internal resistance
- High resistance to water loss with the right charging set up
- Ultra stable polymer separator with glass mat for increased performance
- High resistance to shorting due to superior mechanical strength of the polymer separator
- Increased tolerance to poor charging parameters
- Can be discharged even when full recharge has not been achieved, without loss of battery capacity

Advantages of AGM Batteries:

- Lower initial cost when compared to equivalent power Gel
- Ideal for starting and stationary applications
- Superior performance for shorter duration / higher current discharges
- Smaller size battery can be used for higher rate discharges.

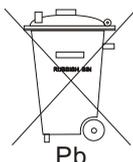


Capacity temperature correction Factor to be applied to Data at 20 Degrees C

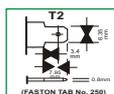
Discharge Time	-30 °C	-20 °C	-10 °C	0 °C	5 °C	10 °C	15 °C	20 °C	25 °C	30 °C	35 °C	40 °C	50 °C
5 minutes to 59 minutes	0.25	0.4	0.5	0.8	0.86	0.91	0.96	1	1.037	1.063	1.085	1.1	1.116
1 Hour to 100 Hours	0.26	0.44	0.58	0.86	0.9	0.93	0.97	1	1.028	1.05	1.063	1.07	1.078

**Website: www.hazebattery.com
E mail : sales@hazebattery.com**

Haze Battery Company keenly encourages environmental awareness; PLEASE follow guidelines for the recycling /disposal of lead.



TERMINAL OPTIONS



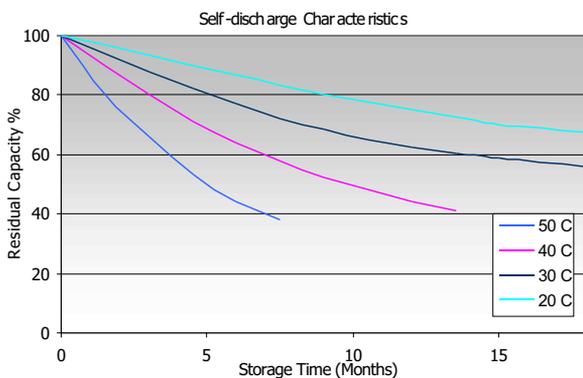
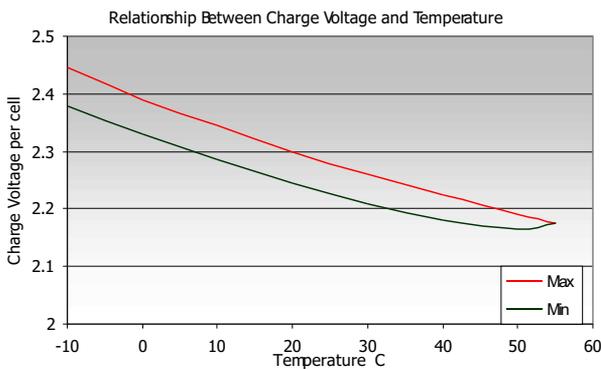
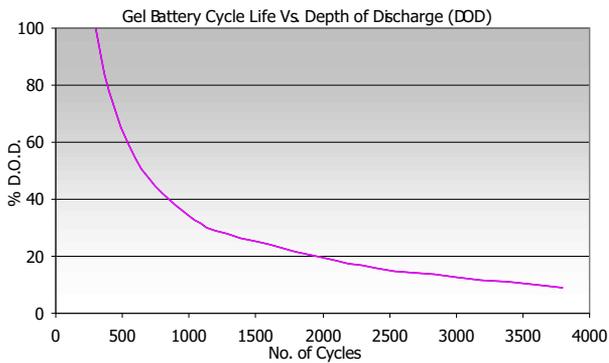
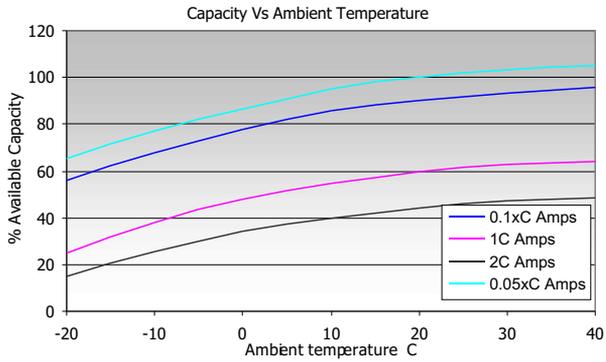
T3 Insert M6

T4 Cu Flag

T5 Lead Flag

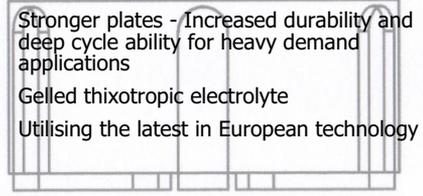
T6 J Type

T7 Automotive



Innovative Features

- Completely maintenance free, sealed construction eliminates the need for watering
- Spill proof / leak proof
- Valve regulated Max internal pressure 2.5 psi
- Multi-position usage
- Analytical Grade electrolyte
- Multi-cell container
- ABS Case and cover - VO on request
- Low self discharge
- FAA and IATA approved as non-hazardous
- Electrolyte will not stratify, no equalization charge required
- Stronger plates - Increased durability and deep cycle ability for heavy demand applications
- Gelled thixotropic electrolyte
- Utilising the latest in European technology



Specifications

Nominal Voltage	6 & 12 Volts
Operating Temperature	-20 °C to 50 °C
Grid alloy	Calcium / Tin lead alloy
Plates	Flat Pasted
Separator	Gel - Microporous Duroplastic
Active material	Very high purity lead
Case and cover	ABS (VO on request)
Charge Voltage	See page 3 Max ripple 0.05C (A)
Electrolyte	Sulphuric acid Analytical grade purity
Venting Valve	EPDM Rubber 1.5 to 2 psi (10.5 - 14 KPa) release pressure. Resealing at 1 psi (7 KPa)
Torque setting	The recommended torque value for insert & automotive types is 5-7 Nm
Cables	Insulated cables / connectors supplied on request.
Design Life (HZY12-7.5 to HZY12-12)	5 Years
Design Life (All others)	12 Years

Model No	Volts	Capacity - Ampere Hour to 1.8 VPC @20 °C								Dimensions & Weight mm & inches							
		100 Hr	72 Hr	48 Hr	20 Hr	10 Hr	5 Hr	3 Hr	1 Hr	L	W	H (TOTAL)	Kg	lbs			
HZY-SL12-7.5	12	8.3	7.9	7.7	7.4	6.2	5.6	5.4	4.2	150	5.91	63	2.5	99	3.9	2.5	5.5
HZY-SL12-12	12	11.0	10.4	10.2	9.8	8.5	7.6	7.2	6.9	152	5.98	99	3.9	99	3.9	4.0	8.8
HZY-SL12-18	12	17.6	16.6	16.2	15.6	13.9	12.5	11.1	8.8	181	7.13	76	3.0	167	6.6	5.4	11.9
HZY-SL12-26	12	28.1	26.6	25.9	25.0	22.0	19.5	17.5	15.0	168	6.61	178	7.0	124	4.9	8.0	17.7
HZY-SL12-33	12	35.0	33.1	32.2	31.1	27.0	23.3	21.1	17.9	196	7.72	131	5.2	160	6.3	10.3	22.8
HZY-SL12-44	12	43.9	41.5	40.4	39.0	34.3	30.3	28.7	25.3	198	7.80	167	6.6	157	6.2	13.0	28.7
HZY-SL12-55	12	56.4	53.4	51.9	50.1	43.5	39.1	36.4	31.1	229	9.02	138	5.4	213	8.4	18.4	40.7
HZY-SL12-70J	12	68.6	65.0	63.2	61.0	53.3	48.6	46.3	41.1	349	13.7	168	6.6	175	6.9	21.0	46.4
HZY-SL12-80	12	81.0	76.7	74.6	72.0	62.6	57.6	53.9	48.2	259	10.2	168	6.6	211	8.3	25.1	55.5
HZY-SL12-100	12	97.9	92.7	90.1	87.0	78.0	68.8	62.2	55.2	306	12.0	168	6.6	211	8.3	29.3	64.8
HZY-SL12-110	12	114	108	105	101	88.5	78.6	73.5	61.8	329	13.0	173	6.8	209	8.2	32.2	71.2
HZY-SL12-120	12	124	117	114	110	99.0	87.3	83.5	70.7	409	16.1	177	7.0	225	8.9	36.0	79.6
HZY-SL12-135	12	149	141	137	132	116	102	96.2	85.6	342	13.5	173	6.8	282	11.1	43.7	96.6
HZY-SL12-150	12	154	146	142	137	122	108	102	90.0	483	19.0	170	6.7	242	9.5	45.5	101
HZY-SL12-160	12	170	161	156	151	139	124	116	100	530	20.9	209	8.2	214	8.4	53.7	119
HZY-SL12-200	12	206	195	190	183	163	148	140	121	522	20.6	242	9.5	220	8.7	63.4	140
HZY-SL12-230	12	237	225	219	211	191	169	155	130	521	20.5	270	10.6	205	8.1	69.5	154
HZY-SL6-180	6	191	181	176	170	155	142	131	114	260	10.2	181	7.1	246	9.7	29.6	65.4
HZY-SL6-225	6	237	225	219	211	190	168	154	129	244	9.6	188	7.4	275	10.8	33.8	74.7

Model No	Volts	Capacity - Watt Hour Per Cell to 1.8 VPC @20 °C							
		100 Hr	72 Hr	48 Hr	20 Hr	10 Hr	5 Hr	3 Hr	1 Hr
HZY-SL12-7.5	12	16.6	15.7	15.2	14.5	12.1	10.9	10.3	8.0
HZY-SL12-12	12	22.0	20.8	20.2	19.3	16.6	14.7	13.9	13.2
HZY-SL12-18	11	35.0	33.1	32.1	30.7	27.1	24.2	21.4	16.9
HZY-SL12-26	12	56.2	53.1	51.4	49.1	42.9	37.7	33.7	28.7
HZY-SL12-33	12	69.9	66.0	64.0	61.1	52.7	45.1	40.6	34.3
HZY-SL12-44	12	87.6	82.8	80.2	76.6	66.9	58.6	55.3	48.5
HZY-SL12-55	12	113	106	103	98.5	84.8	75.6	70.1	59.6
HZY-SL12-70J	12	137	129	125	120	104	94.0	89.2	78.7
HZY-SL12-80	12	162	153	148	142	122	111	104	92.3
HZY-SL12-100	12	195	185	179	171	152	133	120	106
HZY-SL12-110	12	227	214	208	198	173	152	142	118
HZY-SL12-120	12	247	233	226	216	193	169	161	135
HZY-SL12-135	12	297	280	272	259	226	197	185	164
HZY-SL12-150	12	308	291	282	269	238	209	196	172
HZY-SL12-160	12	339	321	311	297	271	240	223	192
HZY-SL12-200	12	411	388	376	360	318	286	270	232
HZY-SL12-230	12	474	448	434	415	373	327	298	249
HZY-SL6-180	6	382	361	350	334	302	275	252	218
HZY-SL6-225	6	474	448	434	415	371	325	297	247

SAMPLE CALCULATION

If we have a 24 Volt system with a load of 90 Watts and the required autonomy is 100 hours.

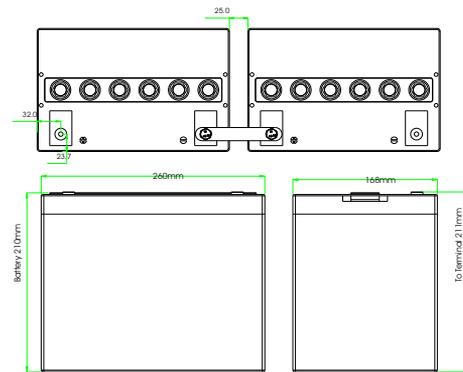
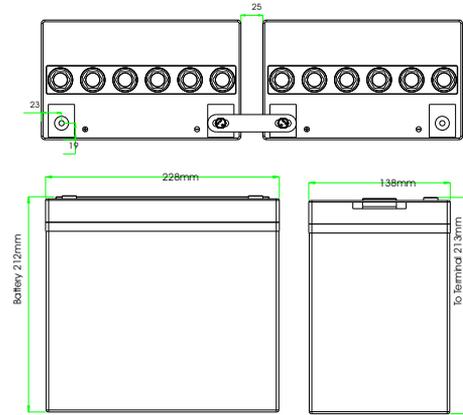
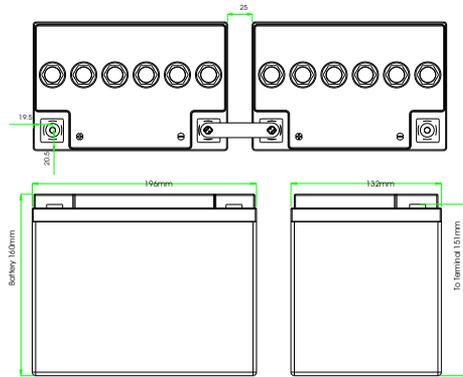
24 Volts = 12 cells (2V Per Cell)

90 Watts x 100 hrs = 9,000 Watt hours

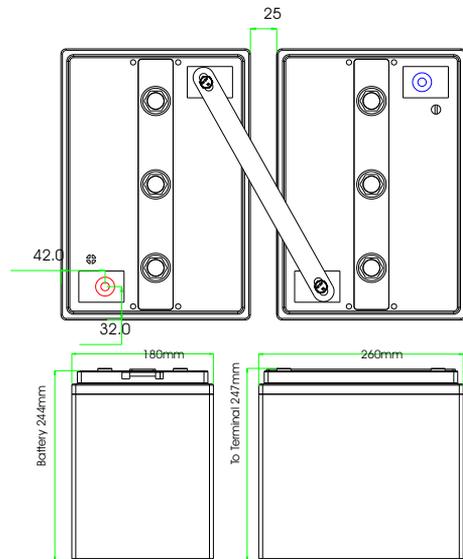
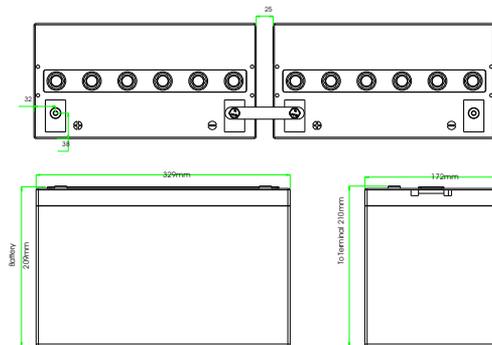
9,000 / 12 Cells = 750 Watt hours / Cell

From the 100 hr column in the above table we have two options:

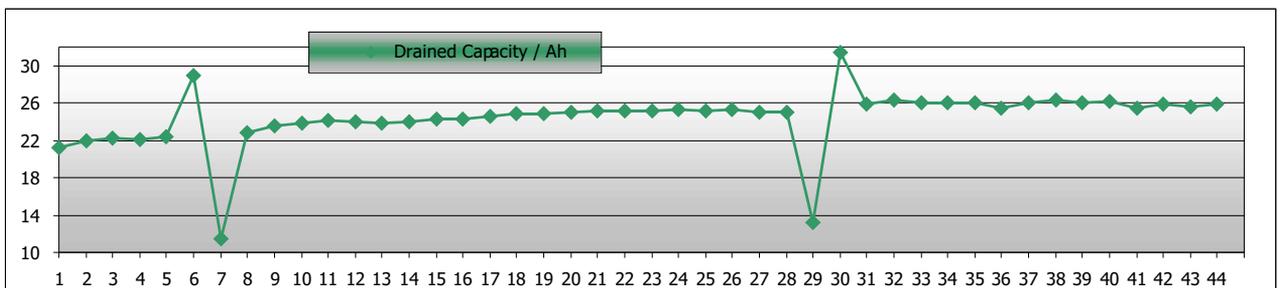
- 1) The HZY-SL12-200 gives 411 Watt Hr per cell to 1.8 vpc.
The system would therefore require 2 batteries per string (in series) to give 24 Volts and 2 strings in parallel to give 822 Watt hrs. (2x411) Total batteries required = 4 x HZY-SL12-200.
- 2) The HZY-SL6-180 gives 382 Watt Hr per cell to 1.8 vpc.
The system would therefore require 4 batteries per string (in series) to give 24 Volts and 2 strings in parallel to give 764 Watt hrs. (2x382) Total Batteries required = 8 x HZY-SL6-180.



Drawings: Full battery and layout drawings are available - Please ask for the relevant drawing. Insulated Cable or Busbar connectors can also be supplied with the batteries.



CAPACITY The cycling characteristics are in part due to addition of phosphoric acid, this however has a negative effect on the capacity of the battery for the first 20-25 cycles. For SOLAR applications the capacity will therefore increase to full capacity over the first month after the installation. The Ah graph for an HZY-SL12-33 is shown below, the 2 spikes shown are 20h & 15 min tests respectively.





VRLA Product Range

- 4, 6 & 12 Volt AGM 1.3 to 230AH
- 6 & 12 Volt Gel 7.5 to 230AH
- 12 Volt Front Access AGM
- 12 Volt Front Access Gel
- 2 Volt AGM & Gel 50 to 3850AH